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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/602,918	06/25/2003	Masahiko Niwayama	60188-542	2016

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Jack Q. Lever, Jr.
McDERMOTT, WILL & EMERY
600 Thirteenth Street, N.W.
Washington, DC 20005-3096

EXAMINER	
DANG, PHUC T	

ART UNIT	PAPER NUMBER
2818	

DATE MAILED: 08/05/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/602,918	NIWAYAMA ET AL.	
	Examiner	Art Unit	
	PHUC T DANG	2818	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 June 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,5,6 and 9-11* is/are rejected.

7)☒ Claim(s) *4,7,8,12,15 and 16* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *25 June 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *062503*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Oath/Declaration

1. The oath/declaration filed on June 25, 2003 is acceptable.

Priority

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

3. The office acknowledges receipt of the following items from the applicant:

Information Disclosure Statement (IDS) filed on June 25, 2003.

Specification

4. The specification has been checked to the extent necessary to determine the presence of all possible minor errors. However, the applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1, 3 and 13-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ziger (U.S. Patent No. 6,590,219) in view of Rohatgi et al. (U.S. Patent No. 5,510,271).

Regarding claims 1 and 13-14, Ziger discloses a method for fabricating a semiconductor device, comprising the steps of:

(a) forming at least in a part of a semiconductor substrate a dopant ion implantation-containing semiconductor layer is epitaxially grown by a CVD process absorbing an infrared ray [col. 9, lines 45-55].

Ziger discloses the features of the claimed invention as discussed above, but does not a step of (b) thermally processing the semiconductor substrate at a processing temperature by irradiating the semiconductor substrate with an infrared ray.

Rohatgi et al., however, disclose a step of (b) thermally processing the semiconductor substrate at a processing temperature by irradiating the semiconductor substrate with an infrared ray [col. 12, lines 25-34].

It would have been obvious to one having ordinary skilled in the art at the time the invention was made to apply the teaching of Rohatgi et al. to Ziger discussed above such that thermally processing the semiconductor substrate at a processing temperature by irradiating the semiconductor substrate with an infrared ray for a purpose of improving a process.

Regarding claim 3, Rohatgi et al. discloses the semiconductor substrate is a silicon substrate and wherein the wavelength of the infrared ray is not less than 0.2 μm nor more than 5.0 μm [col. 10, lines 5-9].

It would have been obvious to one having ordinary skilled in the art at the time the invention was made to apply the teaching of Rohatgi et al. to Ziger discussed above such that the

semiconductor substrate is a silicon substrate and wherein the wavelength of the infrared ray is not less than 0.2 μm nor more than 5.0 μm for a purpose of improving a process.

6. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ziger and Rohatgi et al. in view of Adachi et al. (U.S. Patent No. 6,465,284).

Ziger and Rohatgi et al. disclose the features of the claimed invention as discussed above, but does not disclose the step (b) comprises the steps of:

(b1) detecting infrared radiation emitted from the semiconductor substrate; and

(b2) measuring the temperature of the semiconductor substrate based on the intensity of the infrared radiation, and controlling the output of the infrared ray.

Adachi et al., however, disclose the step (b) comprises the steps of:

(b1) detecting infrared radiation emitted from the semiconductor substrate; and

(b2) measuring the temperature of the semiconductor substrate based on the intensity of the infrared radiation, and controlling the output of the infrared ray [col. 6, lines 47-50].

It would have been obvious to one having ordinary skilled in the art at the time the invention was made to apply the teaching of Adachi et al. to Ziger and Rohatgi et al. discussed above such that the step of adjusting the output of the infrared ray by the temperature for a purpose of improving a process.

7. Claims 5-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ziger and Rohatgi et al. in view of Sheng et al. (U.S. Patent No. 5,981,404).

Ziger and Rohatgi et al. disclose the features of the claimed invention as discussed above, but does not disclose in the step of stabilizing the substrate temperature, the substrate temperature is stabilized at 600°C.

Sheng et al., however, disclose in the step of stabilizing the substrate temperature, the substrate temperature is stabilized at 600°C [col. 5, lines 66-col. 6, lines 2].

It would have been obvious to one having ordinary skilled in the art at the time the invention was made to apply the teaching of Sheng et al. to Ziger and Rohatgi et al. discussed above such that in the step of stabilizing the substrate temperature, the substrate temperature is stabilized at 600°C for a purpose of improving a process.

8. Nakasuji discloses the claimed invention except for the process parameters as claimed in claims 9-11. However, the selection of the claimed process parameters would have been obvious to one having ordinary skill in the art at the time the invention was made to improve the method of fabricating a semiconductor sevice, since it is well settle that when the general conditions of a claim are discloses in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

Allowable Subject Matter

9. Claims 4, 7-8, 12, and 15-16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.None of the prior art of records does not disclose wherein the step (b) further comprises the step of maintaining the substrate at a temperature lower than the processing temperature prior to the thermal processing to be performed at the

processing temperature, thereby stabilizing the substrate temperature as recited in claim 4 and wherein in the step (b1), infrared radiation emitted from the bottom surface of the semiconductor substrate is detected as recited in claim 7 and wherein the semiconductor layer provided in the step (a) is formed over She entire surface of the semiconductor substrate in plan view as recited in claim 8 and wherein the step (a) comprises the step of thermally diffusing a dopant into the semiconductor substrate using a gas containing a dopant in its molecules, and wherein the semiconductor layer is formed in a lower part of the semiconductor substrate as recited in claim 12 and wherein the step (a) further comprises the steps of forming the semiconductor substrate by bonding a plurality of semiconductor substrates to each other and wherein at least one of the plurality of substrates has a. semiconductor layer as recited in claim 15 (a), the step of forming a semiconductor element on the semiconductor substrate, and wherein the step (b) is performed as a part of the step of forming a semiconductor element on the semiconductor substrate as recited in claim 16.

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Phuc T. Dang whose telephone number is (571) 272-1776. The examiner can normally be reached on 8:00 am-5:00 pm.

11. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David C. Nelms can be reached on (571) 272-1787. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9306 for regular communications and After Final communications.

12. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

Phuc T. Dang PD

Primary Examiner

Art Unit 2818